

cial formation, that of Toronto, has furnished a large flora and fauna showing temperate conditions during a time long enough to cut a river channel 15 feet deep, then to build a delta 25 miles wide and in places 186 feet thick, and finally to cut river valleys with a width of a mile through the delta to the depth of more than 150 feet. These changes in the hydrography were associated with great changes in the level of an interglacial lake Ontario, caused by the upward and afterwards downward warping of its outlet at least 150 feet. It is estimated that the whole series of events required not less than three times as much time as has elapsed since the retreat of the last ice sheet, when Niagara Falls began its work. This interglacial period lasted therefore from 20,000 to 100,000 years. Interglacial beds of almost certainly the same age occur on lake Erie 240 miles to the south-west; and the interglacial lignite beds of the Hudson Bay slope were probably formed at the same time. There is no permanent ice sheet at present in Labrador, and conditions were even less favorable for the continuance of an ice sheet in that region during the Toronto and Moose river interglacial period.

It appears certain therefore that during at least one interglacial period eastern America enjoyed climatic conditions like the present and was entirely free from glaciers. That the deglaciation in the other recognized interglacial periods was as complete is probable but not yet proved. These conclusions imply a very great complexity and a very long time for the Pleistocene. The full series of Ice Ages and Interglacial periods must have required several hundred thousand years, and recent times may represent only the first third of another interglacial period.

Confusion has been caused in the past by the assumption that local Alpine glaciers afford a model of the methods and conditions of continental ice sheets. Nothing can be more misleading than to infer from the habits of little tongues of ice flowing down steep valleys that sheets of ice covering millions of square miles moving outwards under the pressure due to their own thickness of 10,000 feet or more at the center will act in the same way. Even Greenland with its mountainous border confining the inland ice and permitting it to escape only through